

Application Serial No. 09/837,102
Reply to Office Action of March 30, 2004

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1 canceled

2. (currently amended) A filter cartridge which is prepared by winding a non-woven fabric strip comprising a thermoplastic fiber around a perforated cylinder in a twill form, said thermoplastic fiber being direction aligned, wherein the non-woven fabric strip satisfies the following equation (B):

$$\log_{10} Y < 3.75 - 0.75 (\log_{10} X) \quad (B)$$

wherein X (cm³/cm²/sec) is an airflow amount of the non-woven fabric strip measured in accordance with JIS L 1096-A (1990), and Y (g/m²) is a basis weight thereof; and

wherein the direction aligned fiber non-woven fabric is produced by a spun bonding method.

3. (currently amended) A filter cartridge which is prepared by winding a non-woven fabric strip comprising a thermoplastic fiber around a perforated cylinder in a twill form, wherein:

 in winding in a the twill form, a number (W) of winding the non-woven fabric strip from one end to another end in a longitudinal direction of the perforated cylinder is one to 10 per a length of 250 mm in the perforated cylinder;

when a 2-fold value (2W) of the winding number (W) is represented by a fraction having a denominator of two figures or less which is a non-reducible approximate value, the denominator is 4 to 40; and

the direction aligned non-woven fabric is produced by a spun bonding method.

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4 canceled

5. (previously presented) The filter cartridge as claimed in claim 2, wherein at least a part of fiber intersections of the non-woven fabric strip is thermally bonded.

6. (previously presented) The filter cartridge as claimed in claim 2, wherein the non-woven fabric strip has a width of 0.5 to 40 cm.

7. (previously presented) The filter cartridge as claimed in claim 2, wherein a product of a width (cm) and a basis weight (g/m^2) of the non-woven fabric strip is 10 to 200.

8. (previously presented) The filter cartridge as claimed in claim 2, wherein the non-woven fabric strip has a thickness of 0.02 to 1.20 mm.

9. (previously presented) The filter cartridge as claimed in claim 2, wherein the non-woven fabric strip is thermal compression bonded by means of a heat embossing roll having an embossing area rate of 5 to 25%.

10. (previously presented) The filter cartridge as claimed in claim + 2, wherein the filter material of the filter cartridge has a void rate of 65 to 85%.

11-13 canceled

14. (previously presented) The filter cartridge as claimed in claim 2, wherein the thermoplastic fiber is a composite fiber comprising a low melting resin and a high melting resin, a difference of the melting points between these resins being 10°C or more.

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15. (previously presented) The filter cartridge as claimed in claim 2, wherein the thermoplastic fiber is a fiber formed from at least one thermoplastic resin selected from the group consisting of a polyester resin, a polyamide resin, a polyethylene resin and a polypropylene resin.

16. (withdrawn) A process for producing a filter cartridge, which comprises winding a non-woven fabric strip comprising a thermoplastic fiber around a perforated cylinder in a twill form, wherein the non-woven fabric strip satisfies the following equation (A):

$$\log_{10} Y < 3.75 - 0.6 (\log_{10} X) \quad (A)$$

wherein X ($\text{cm}^3/\text{cm}^2/\text{sec}$) is an airflow amount of the non-woven fabric strip measured in accordance with JIS L 1096-A (1990), and Y (g/m^2), and Y (g/m^2) is a basis weight thereof.

17. (withdrawn) A process for producing a filter cartridge, which comprises winding a non-woven fabric strip comprising a thermoplastic fiber around a perforated cylinder in a twill form, wherein in winding in a twill form, a number (W) of winding the non-woven fabric strip from one end to the other end in a longitudinal direction of the perforated cylinder is one to 10 per a length of 250 mm in the perforated cylinder.

18 canceled

19. (previously presented) The filter cartridge as claimed in claim 3, wherein at least a part of fiber intersections of the non-woven fabric strip is thermally bonded.

20. (previously presented) The filter cartridge as claimed in claim 3, wherein the non-woven fabric strip has a width of 0.5 to 40 cm.

21. (previously presented) The filter cartridge as claimed in claim 3, wherein a product of a width (cm) and a basis weight (g/m^2) of the non-woven fabric strip is 10 to 200.

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22. (previously presented) The filter cartridge as claimed in claim 3, wherein the non-woven fabric strip has a thickness of 0.02 to 1.20 mm.

23. (previously presented) The filter cartridge as claimed in claim 3, wherein the non-woven fabric strip is thermal compression bonded by means of a heat embossing roll having an embossing area rate of 5 to 25%.

24. (previously presented) The filter cartridge as claimed in claim 3, wherein the filter material of the filter cartridge has a void rate of 65 to 85%.

25 canceled

26. (previously presented) The filter cartridge as claimed in claim 3, wherein the thermoplastic fiber is a composite fiber comprising a low melting resin and a high melting resin, a difference of the melting points between these resins being 10°C or more.

27. (previously presented) The filter cartridge as claimed in claim 3, wherein the thermoplastic fiber is a fiber formed from at least one thermoplastic resin selected from the group consisting of a polyester resin, a polyamide resin, a polyethylene resin and a polypropylene resin.

28 canceled